What is claimed is:

1. A wavelength stabilized laser module comprising:

a semiconductor laser;

a temperature calibrating unit to calibrate a temperature of said semiconductor laser;

a converting unit to convert light emitted from said semiconductor laser to parallel luminous flux;

a first photoelectric converting unit to receive a part of said parallel luminous flux and to convert it to an electric signal;

a filter to receive a part of said parallel luminous flux and to continuously change its transmittance depending on wavelengths of said parallel luminous flux;

a second photoelectric converting unit to receive light transmitted through said filter and to convert it to an electric signal; and

wherein a control signal, to be used for stabilization, obtained by computations of said electric signal fed from said first photoelectric converting unit and said second photoelectric converting unit, is fed back to said semiconductor laser and/or said temperature calibrating unit so that said semiconductor laser is able to stably emit laser light having a reference wavelength to be used as a target for stabilization of wavelengths.

2. The wavelength stabilized laser module according to Claim 1, wherein said first photoelectric converting unit and said second photoelectric converting unit are so configured as to

receive backward emitted light from said semiconductor laser.

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3. The wavelength stabilized laser module according to Claim 1, wherein said converting unit to convert light emitted from said semiconductor laser to said parallel luminous flux is a lens and wherein one part of said single parallel luminous flux transmitted through said lens is incident on said first photoelectric converting unit and another part of said parallel flux is incident on said filter.

4. The wavelength stabilized laser module according to Claim 1, wherein a degree of parallelization of said parallel luminous flux is within ± 2°.

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5. The wavelength stabilized laser module according to Claim 1, wherein said filter has a transmission characteristic in which transmittance of said filter becomes high or low monotonically depending on wavelengths within a band of wavelengths containing said reference wavelength.

6. The wavelength stabilized laser module according to Claim 1, wherein said filter is able to change, by adjusting an angle of incidence, a gradient of changes in transmittance which changes depending on wavelengths.

7. The wavelength stabilized laser module according to Claim 1, wherein said filter has a unimodal transmission characteristic in which transmittance of said filter becomes maximum and minimum in a band of wavelengths not containing said

reference wavelength.

8. The wavelength stabilized laser module according to Claim 1, wherein said filter is a multilayer filter made up of dielectric multilayers formed on a transparent substrate.

9. The wavelength stabilized laser module according to Claim 1, wherein said filter is an etalon-type filter exhibiting a transmittance period in which transmittance of said filter becomes maximum and minimum repeatedly at a constant interval of wavelengths.

10. The wavelength stabilized laser module according to Claim 9, wherein said semiconductor laser is a wavelength tunable semiconductor laser that is able to emit light having a plurality of wavelengths which change depending on temperatures and said interval of wavelengths in said transmittance period of said etalon-type filter is set by an equation:

$$D = (1 - Tetalon / TLD) \times D0 \cdots (1)$$

where said "D" represents said interval of wavelengths in said transmittance period of said etalon-type filter, said "D0" represents an interval of said plurality of wavelengths of light emitted from said semiconductor laser, said "Tetalon" represents an amount of a change in a central wavelength occurring when a temperature of said etalon-type filter changes by 1°C and said "TLD" represents an amount of a change in an oscillation wavelength occurring when a temperature of said semiconductor laser changes by 1°C, however, said central wavelength represents one wavelength that causes said transmittance to be maximum.

11. The wavelength stabilized laser module according to Claim 1, wherein said filter is made up of a transparent material having reflectivity being higher than that of silica glass.

12. The wavelength stabilized laser module according to Claim 11, wherein said transparent material is a silicon based material.

13. The wavelength stabilized laser module according to Claim 1, wherein said filter is fixed to said second photoelectric converting unit.

14. The wavelength stabilized laser module according to Claim 8, wherein said filter is formed on a light receiving surface of said second photoelectric converting unit by a coating method.

15. The wavelength stabilized laser module according to Claim 1, wherein said first photoelectric converting unit and said second photoelectric converting unit are placed in parallel on a holding substrate and make up an array-shaped optical detector.

16. The wavelength stabilized laser module according to Claim 1, wherein a light receiving surface of said first photoelectric converting unit is placed in a tilt manner relative to an optical axis of incident light.

17. The wavelength stabilized laser module according to Claim 1, wherein said semiconductor laser has a configuration of a device integrated with an electro-absorption-type

semiconductor optical modulator.

18. The wavelength stabilized laser module according to Claim 1, wherein said temperature calibrating unit is a Peltier device.

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19. The wavelength stabilized laser module according to Claim 1, further comprising an optical fiber used as a device through which laser light is output and a single case housing, at least, said semiconductor laser, said temperature calibrating unit, said converting unit for said light conversion to said parallel luminous flux, said filter and said first photoelectric converting unit and said second photoelectric converting unit.